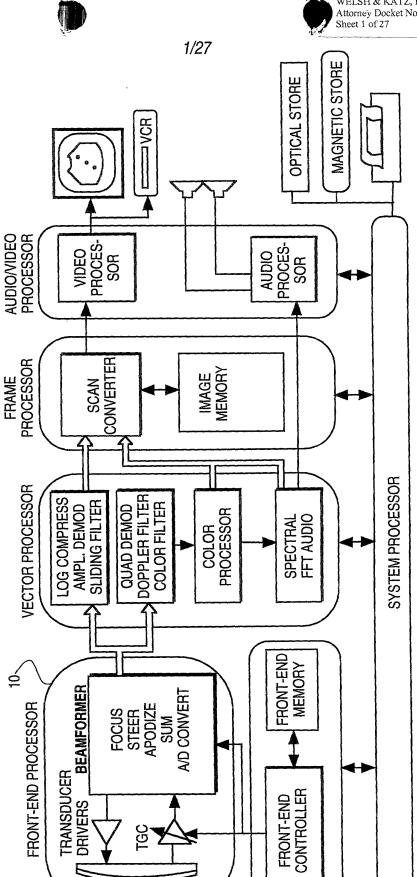
Applicant. Freeman, e. a.

Title: Beamformed Ultrasonic Imager with
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ULTRASONIC IMAGING SYSTEM BLOCK DIAGRAM



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FIG. 2 **PRIOR ART** 

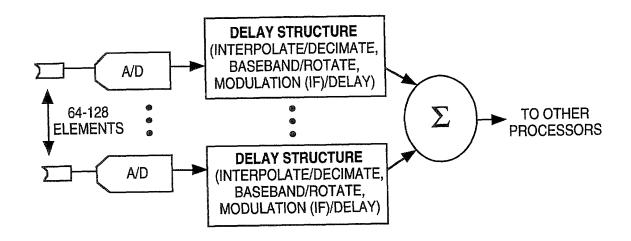
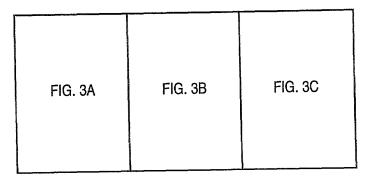


FIG. 3



Title: Beamformed Ultrasonic Imager with
Delta-Sigma Feedback Control

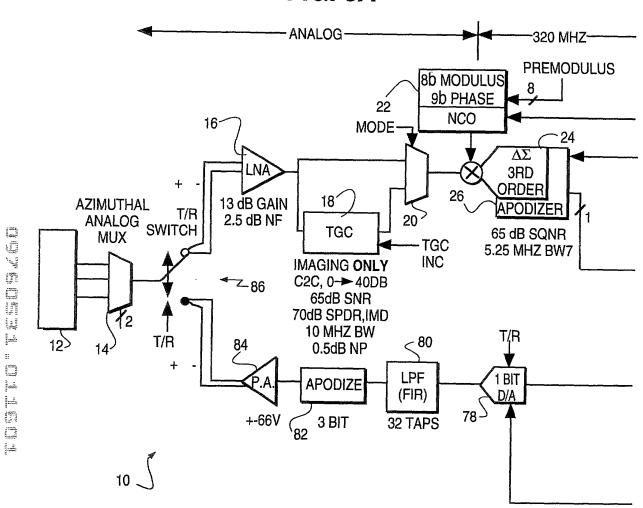
WELSH & KATZ LTD, Phone: (312) 655-15

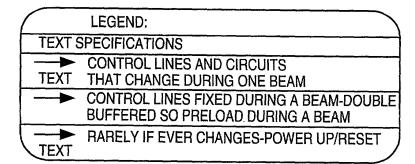
WELSH & KATZ, LTD., Phone: (312) 655-1500 Attorney Docket No. 1693-81437

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FIG. 3A







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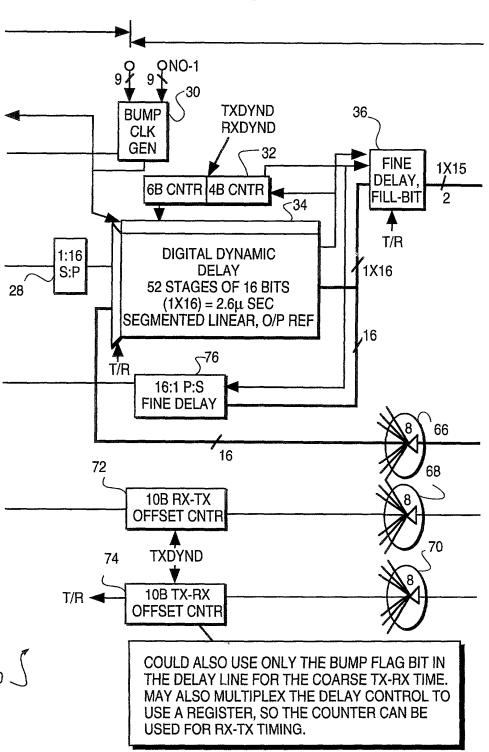
Title Beamformed Ultrasonic Imager with Delta-Sigma Feedback Control WELSH & KATZ, LTD., Phone: (312) 655-1500

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FIG. 3B





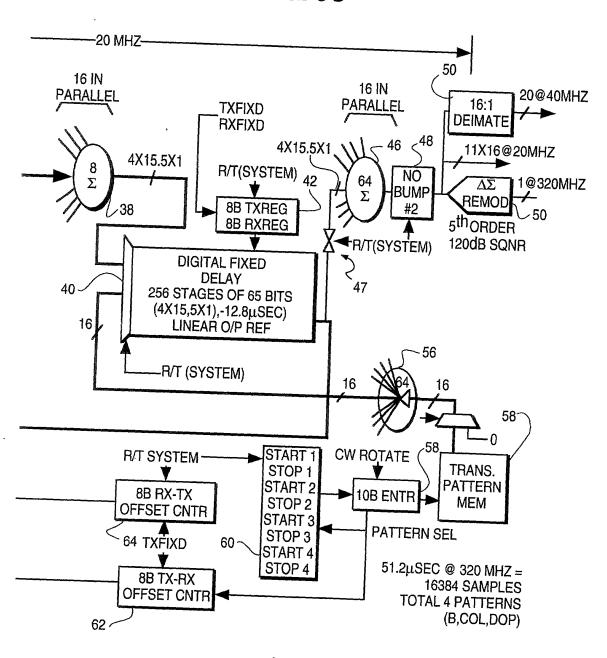
Applicant. Freeman, et al.

Title: Beamformed Ultrasonic Imager with Delta-Sigma Feedback Control ELSH & KATZ, LTD., Phone: (312) 655-1500.

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FIG. 3C

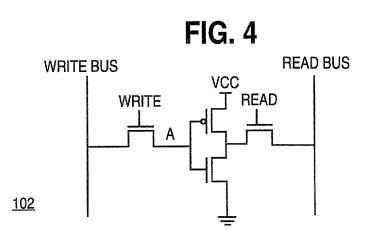


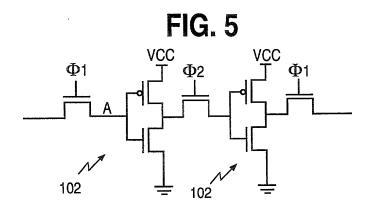
) - 10

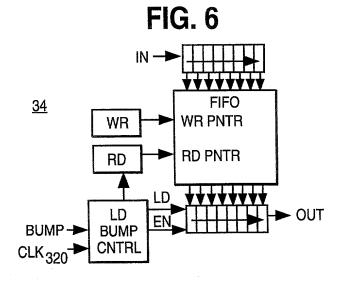
Applicant: Freeman, et al. Title: Beamformed Ultrasonic Imager with Delta-Sigma Feedback Control
WELSH & KATZ, LTD., Phone: (312) 655-1500
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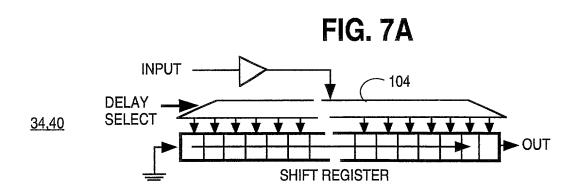
Applicant: Freeman, et al. Title: Beamformed Ultra

Beamformed Ultrasonic Imager with Delta-Sigma Feedback Control WELSH & KATZ, LTD., Phone: (312) 655-1500

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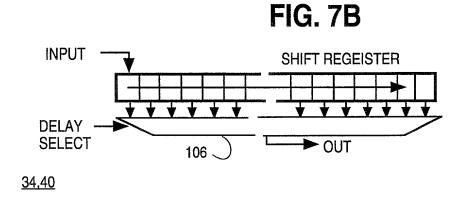
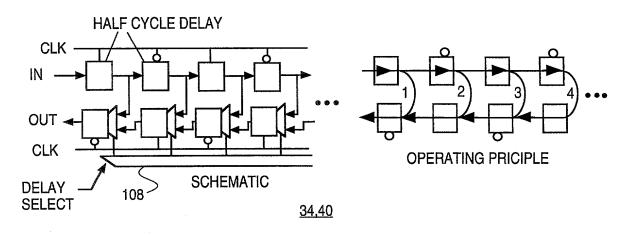
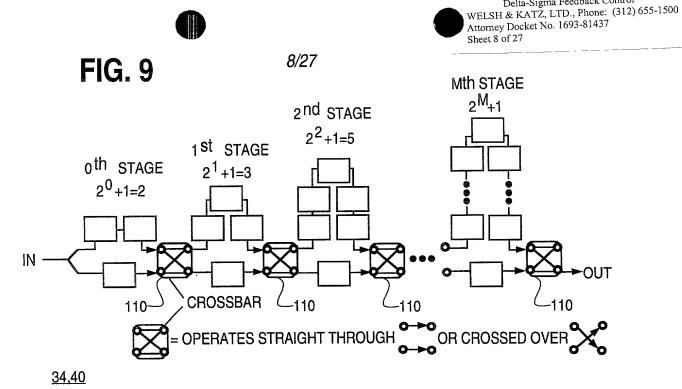


FIG. 8

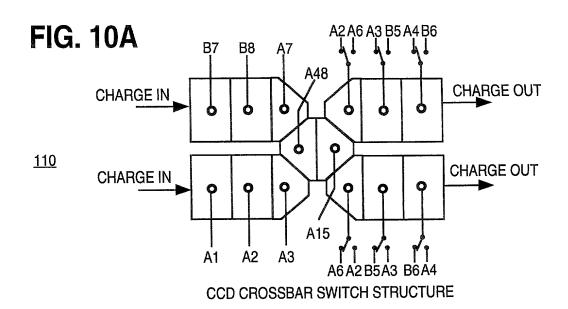


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Title: Beamformed Ultrasonic Imager with Delta-Sigma Feedback Control



**FIG. 10B** 

A1 A2 A3 A4 A5 A6 A7 A8 B5 B6 B7 B8 A48 A1 1 1 0 0 0 0 0 0 1 1 1 1 0 1 0 1 1 0 0 0 0
--

**CLOCK PATTERN** 



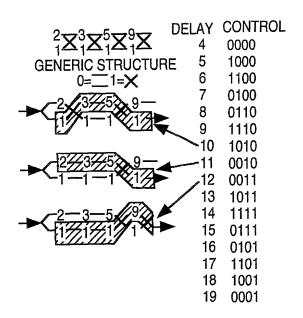
Applicant: Freeman, et al.

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Delta-Sigma Feedback Control

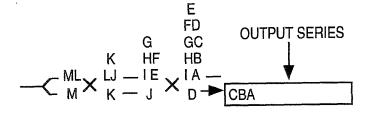
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Attorney Docket No. 1693-81437
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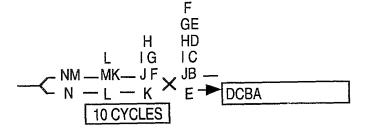


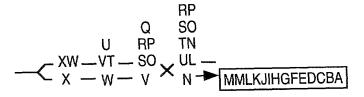


**FIG. 12A** 



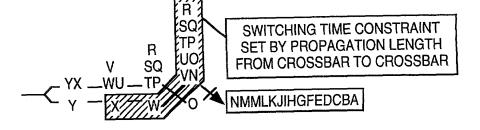
**FIG. 12B** 

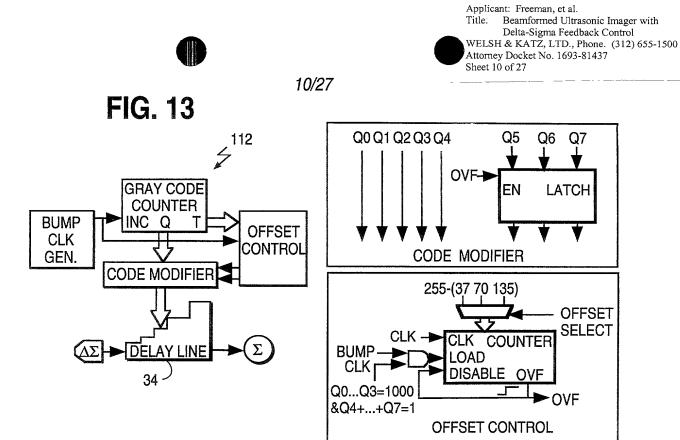


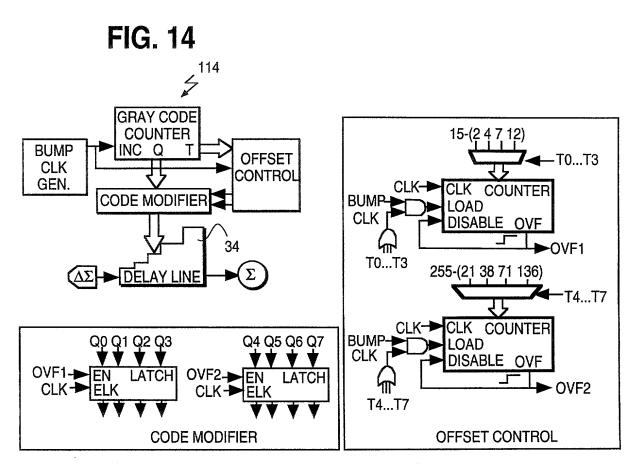


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FIG. 12D







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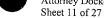






FIG. 15

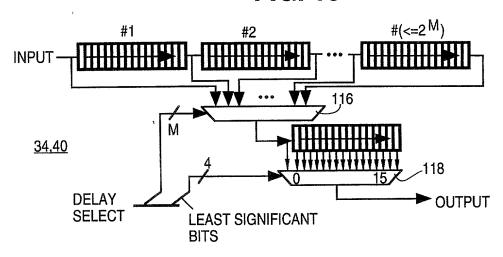
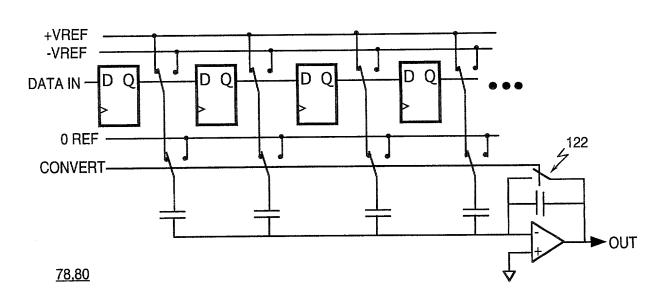


FIG. 16



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FIG. 17

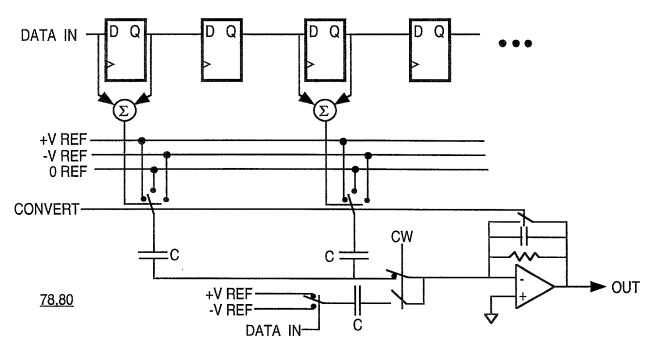
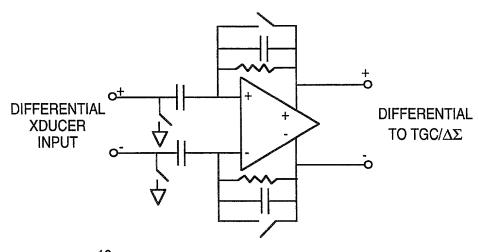


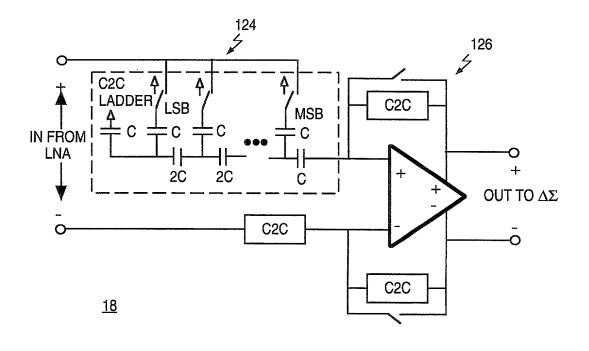
FIG. 18







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Delta-Sigma Feedback Control

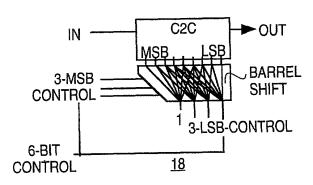
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## FIG. 20A



BARREL SHIFT TECHNIQUE

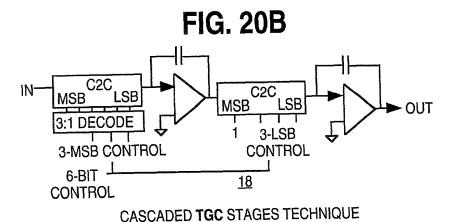


FIG. 21

(8p) NOTE 10

(9p) -10

-20

-40

0

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30

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N - DIGITAL CONTROL WORD





FIG. 22

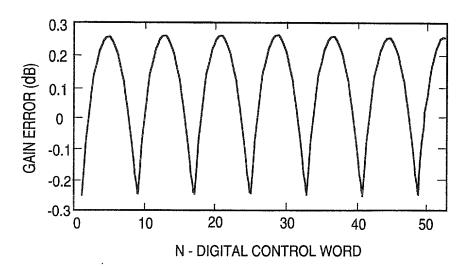
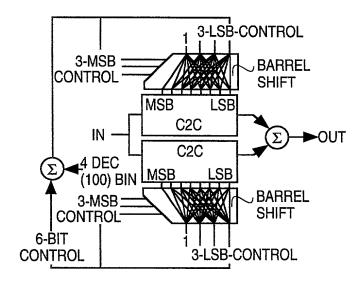


FIG. 23



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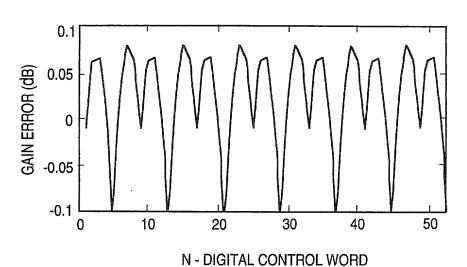
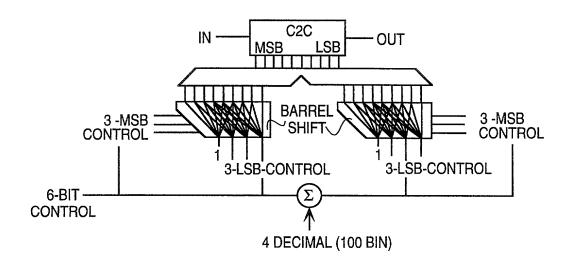


FIG. 25



Applicant: Freeman, et al.

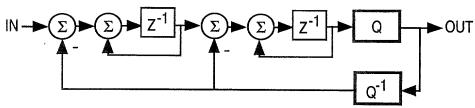
Title: Beamformed Ultrasonic Imager with
Delta-Sigma Feedback Control
WELSH & KATZ, LTD., Phone: (312) 655-15

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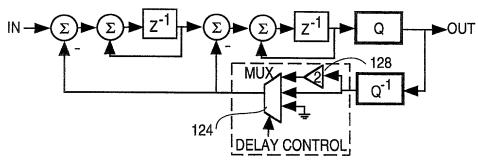
Attorney Docket No. 1693-81437 Sheet 17 of 27







**FIG. 26B** 



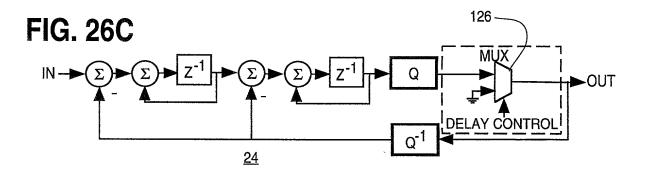
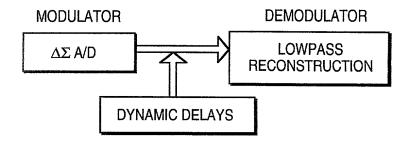


FIG. 27



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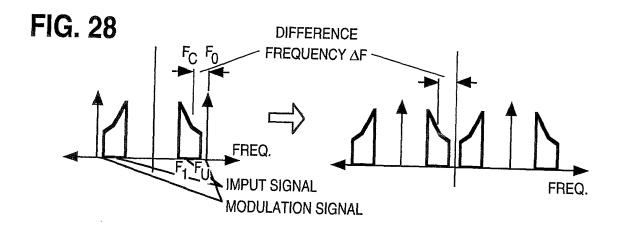
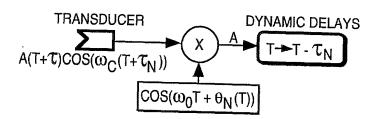


FIG. 29



**FIG. 30A** 

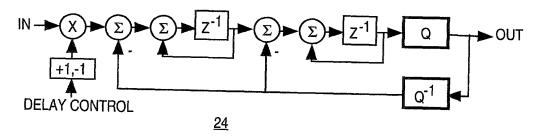
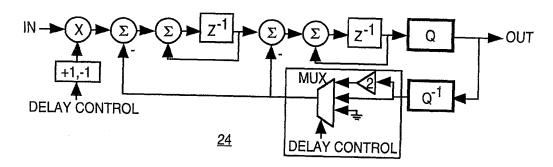


FIG. 30B



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## FIG. 31

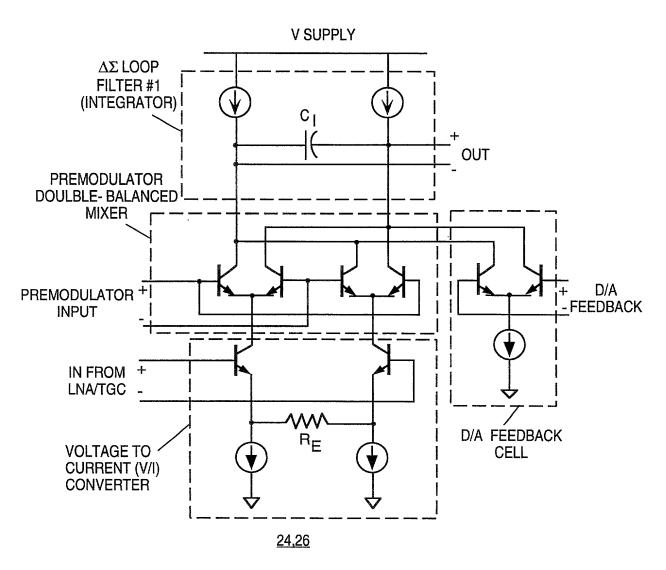
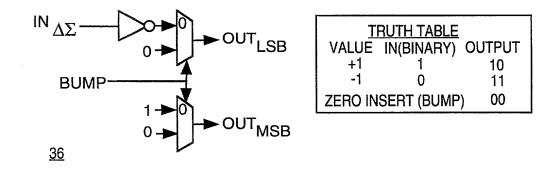


FIG. 32



Applicant: Freeman, et al. Beamformed Ultrasonic Imager with

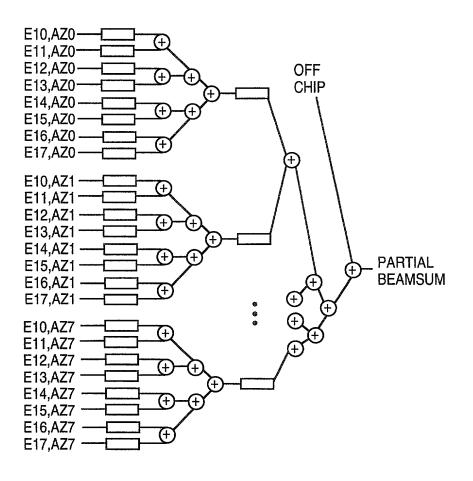
Delta-Sigma Feedback Control WELSH & KATZ, LTD., Phone: (312) 655-1500

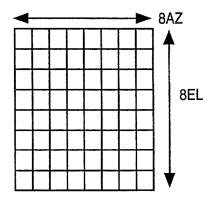
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**FIG. 33A** 





**NORMAL BEAMFORMER** 

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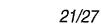
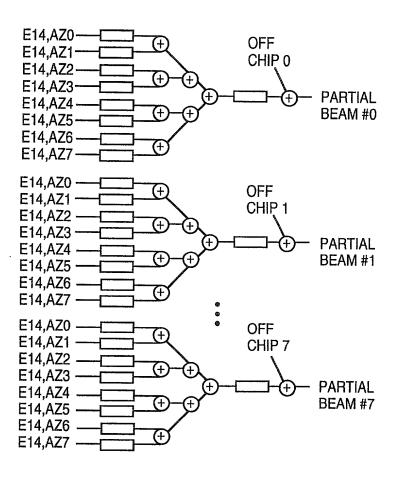
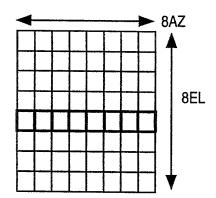


FIG. 33B



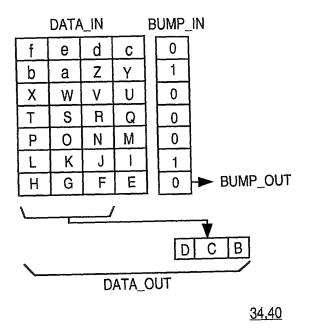


**MULTIBEAM BEAMFORMER** 

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FIG. 34



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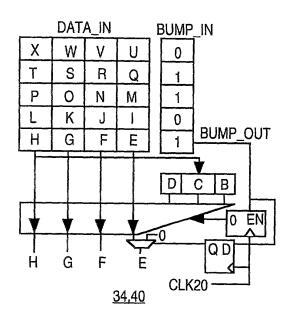


FIG. 35B

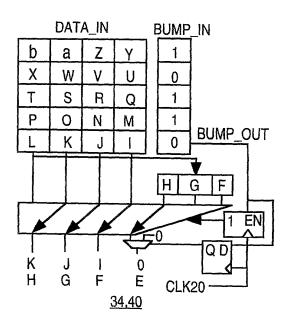
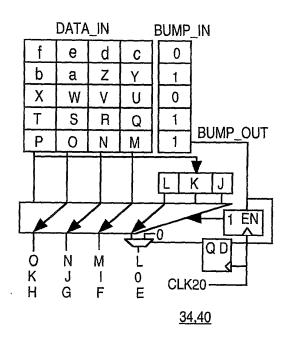


FIG. 35C



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Beamformed Ultrasonic Imager with Delta-Sigma Feedback Control

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**FIG. 36A** 

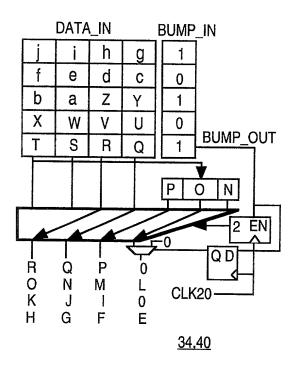


FIG. 36B

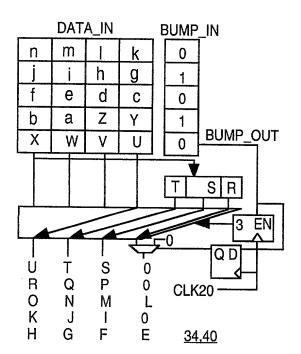
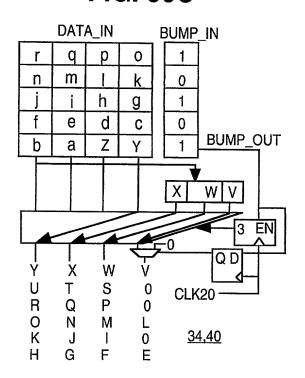


FIG. 36C



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Title: Beamformed Ultrasonic Imager with Delta-Sigma Feedback Control

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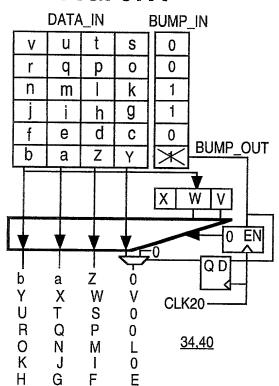
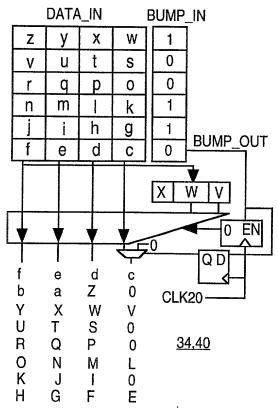


FIG. 37B



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Delta-Sigma Feedback Control
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FIG. 38A

UNSIGNED:

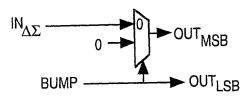


FIG. 38B SIGNED:

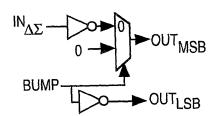


FIG. 38C

UNSIGNED:

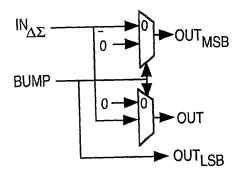
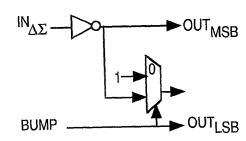


FIG. 38D

SIGNED:



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FIG. 39

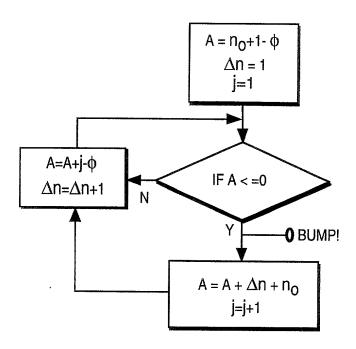


FIG. 40

